PIONEER®
The Art of Entertainment

Service Manual

ORDER NO.
ARP2896

FM/AM STEREO TUNER
F-104

- **Refer to the service manual ARP2790 for F-202L/HEX1K.**

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model	Power Requirement	Remarks
	F-104		
HEIXK	○	AC 220V - 230V	AC 240V,*
HEWZXK	○		

*: **Alter the wiring of the Power-supply block at the primary winding of Power-transformer referring to the "Line Voltage Selection" described in Service Manual.**

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. PO Box 1760, Long Beach, CA 90801-1760, U.S.A.
PIONEER ELECTRONIC [EUROPE] N.V. Haven 1087, Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE. LTD. 501 Orchard Road, #10-00 Lane Crawford Place, Singapore 0923
© PIONEER ELECTRONIC CORPORATION 1995

O-ZFC MAY. 1995 Printed inJapan

CONTRAST OF MISCELLANEOUS PARTS

NOTES:

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by " ◉ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

F-104/HEIXK,HEWZXK and F-202L/HEX1K have the same construction except for the followinng:

Mark	Symbol & Description	Part No.			Remarks
		F-202L/HEX1K	F-104/HEIXK	F-104/HEWZXK	
NSP	TUNER assembly	AWE1278	AWE1278	AWE1276	
	Front panel	AMB2149	AMB7219	AMB7219	
	Insulator assembly	AMR2140	PNW1912	PNW1912	
	Name plate (MET)	AAM1058	. . . . .	. . . . .	
	Name plate (PLS)	. . . . .	PAM1608	PAM1608	
	Operating instructions (English / French / Geman/Italian / Swedish / Dutch / Spanish / Portguese)	ARE1278	ARE7051	. . . . .	
	Operating instructions (Geman)	. . . . .	. . . . .	ARC7071	
	Connection cord with pin plug	ADE-052	PDE1249	PDE1249	
	Connection cord with mini plug	ADE-085	PDE1095	PDE1095	
	FM antenna	ADH1005	ADH7001	ADH7001	
	Loop antenna	ATB1006	ATB7001	ATB7001	
	Packing case	AHD2550	AHD7162	AHD7162	

TUNER ASSEMBLY

AWE1278 and AWE1276 have the same construction except for the followinng:

Mark	Symbol & Description	Part No.		Remarks
		AWE1278	AWE1276	
	C 108	CKPUYF473Z16-TP	. . . . .	
	C 155	CKDYB392K50-T	CKDYB332K50-T	
	C 156	CKDYB392K50-T	CKDYB332K50-T	
	D 102	1SS252-TP	. . . . .	
	D 103	1SS252-TP	. . . . .	
	Q 105	DTC143ES-T	. . . . .	
	Q 107	DTC143ES-T	. . . . .	
	Q 108	DTA124ES-T	. . . . .	
	Q 109	DTC143ES-T	. . . . .	
	Q 118	DTC143ES-T	. . . . .	
	R 131	RD1/8PM103J-TP	. . . . .	
	R 152	RD1/8PM132J-TP	RD1/8PM152J-TP	
	R 168	RD1/8PM242J-TP	RD1/8PM912J-TP	
	R 169	RD1/8PM242J-TP	RD1/8PM912J-TP	
	AM RF tuning block	AXX1042	AXX1041	

4110

PIONEER®
The Art of Entertainment

Service Manual

ORDER NO.
ARP2790

FM/AM DIGITAL SYNTHESIZER TUNER

F-202L

F-202

F-202L AND F-202 HAVE THE FOLLOWING:

Type	Model		Power Requirement	Remarks
	F—202L	F—202		
HEX1K	○	—	AC220V—230V, 240V (switchable)*	
HBX1K	○	—		
HEWZX1K	—	○		
HEWIX1K	—	○		

* Change the connection of the power transformer's primary wiring.

- **This manual is applicable to the following: F-202L/HEX1K and HBX1K; F-202/HEWZX1K and HEWIX1K.**
- **For the following: F-202L/HBX1K; F-202/HEWZX1K and HEWIX1K, refer to page 21.**
- **F-202L covers MW/LW bands while F-202 covers MW.**

CONTENTS

1. SPECIFICATIONS 2
2. BLOCK DIAGRAM 3
3. EXPLODED VIEWS, PACKING AND PARTS LIST ... 4
4. PCB PARTS LIST 7
5. SCHEMATIC AND PCB CONNECTION DIAGRAMS 9
6. ADJUSTMENTS 19
7. FOR F-202L/HBX1K, F-202/HEWZX1K AND HEWIX1K 21
8. PANEL FACILITIES 28

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
PIONEER ELECTRONICS OF CANADA, INC. 300 Allstate Parkway Markham, Ontario L3R 0P2 Canada
PIONEER ELECTRONIC [EUROPE] N.V. Haven 1087 Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911

© PIONEER ELECTRONIC CORPORATION 1993

FK MAY 1993 Printed in Japan

4110

1. SPECIFICATIONS

FM Tuner Section

Frequency range	87.5 MHz to 108 MHz
Usable Sensitivity (IHF)	12.7 dBf (1.2 µV/75 Ω)
50 dB Quieting Sensitivity	Mono: 18 dBf (2.2 µV/75 Ω)
	Stereo: 38.3 dBf (22.6 µV/75 Ω)
Sensitivity (DIN)	Mono: 1.0 µV/75 Ω
	Stereo: 35 µV/75 Ω
Signal-to-Noise Ratio	Mono: 78 dB (at 85 dBf)
	Stereo: 74 dB (at 85 dBf)
Signal-to-Noise Ratio (DIN)	Mono: 62 dB
	Stereo: 60 dB
Distortion	0.3 % (1 kHz)
Alternate Channel Selectivity	60 dB (300 kHz)
Stereo Separation	40 dB (1 kHz)
Frequency Response	30 Hz to 15 kHz ±1 dB
Image Response Ratio	50 dB
IF Response Ratio	90 dB
Antenna Input	75 Ω unbalanced
Output	650 mV/2.7 kΩ (100 % MOD.)

MW (AM) Tuner Section

Frequency range	531 kHz to 1,602 kHz
Sensitivity (IHF, Loop antenna)	350 µV/m
Selectivity	20 dB
Signal-to-Noise Ratio	50 dB
Antenna	Loop Antenna
Output	150 mV/2.7 kΩ (30 % MOD.)

LW Tuner Section

Frequency range	153 kHz to 281 kHz
Sensitivity (IHF, Loop antenna)	1,500 µV/m
Antenna	Loop Antenna
Output	150 mV/2.7 kΩ (30 % MOD.)

Miscellaneous

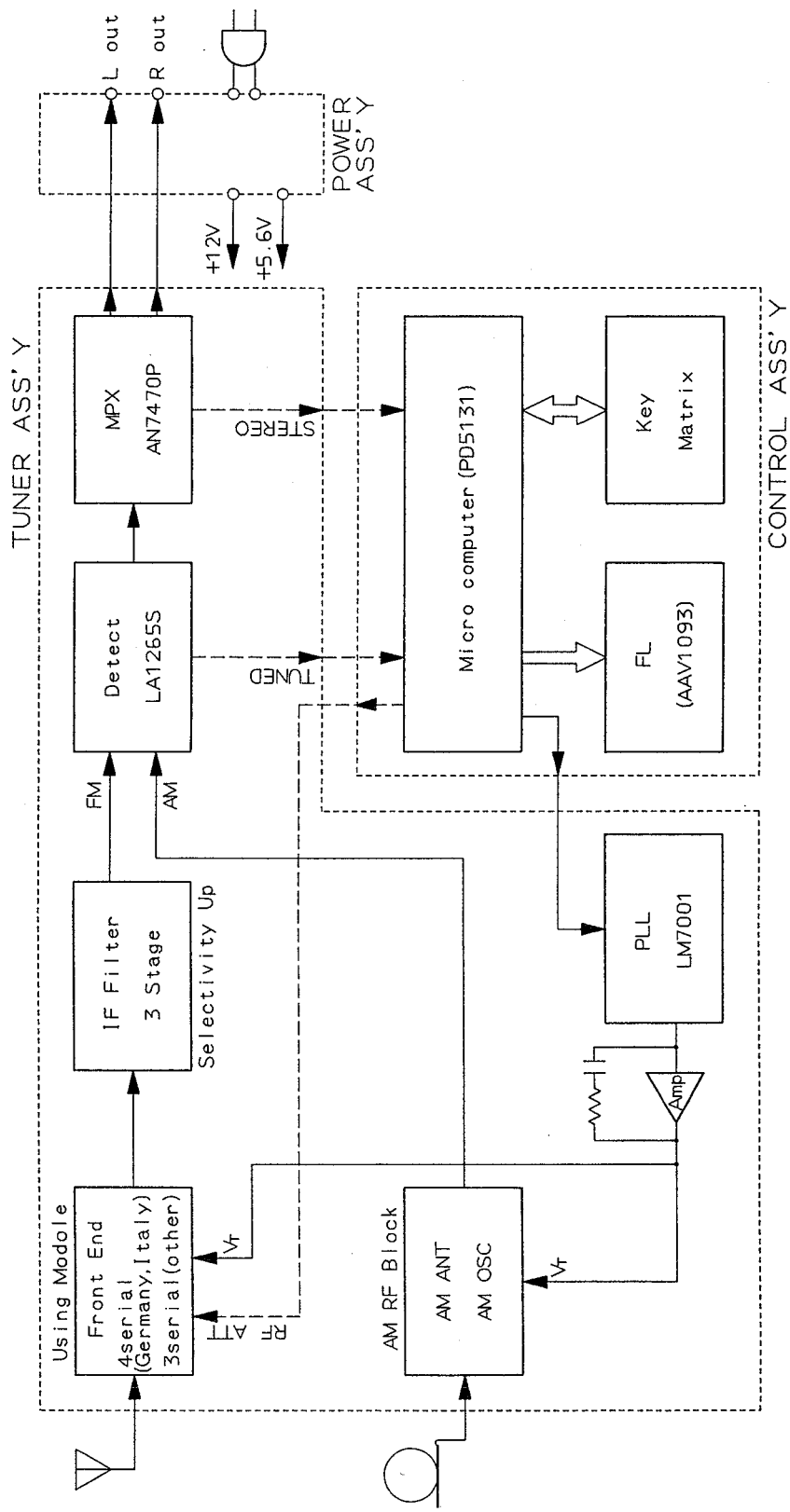
Power Requirements	a.c. 220 — 230 Volts ~ , 50/60 Hz
Power Consumption	10 W
Dimensions	420 (W) x 75.5 (H) x 284 (D) mm
Weight (without package)	2.6 kg

Furnished Parts

FM T-type antenna	1
AM loop antenna	1
Connecting cord with pin plugs	1
Operating instructions	1
Control cord	1

NOTE:
Specifications and design are subject to possible modification without notice due to improvements.

2. BLOCK DIAGRAM

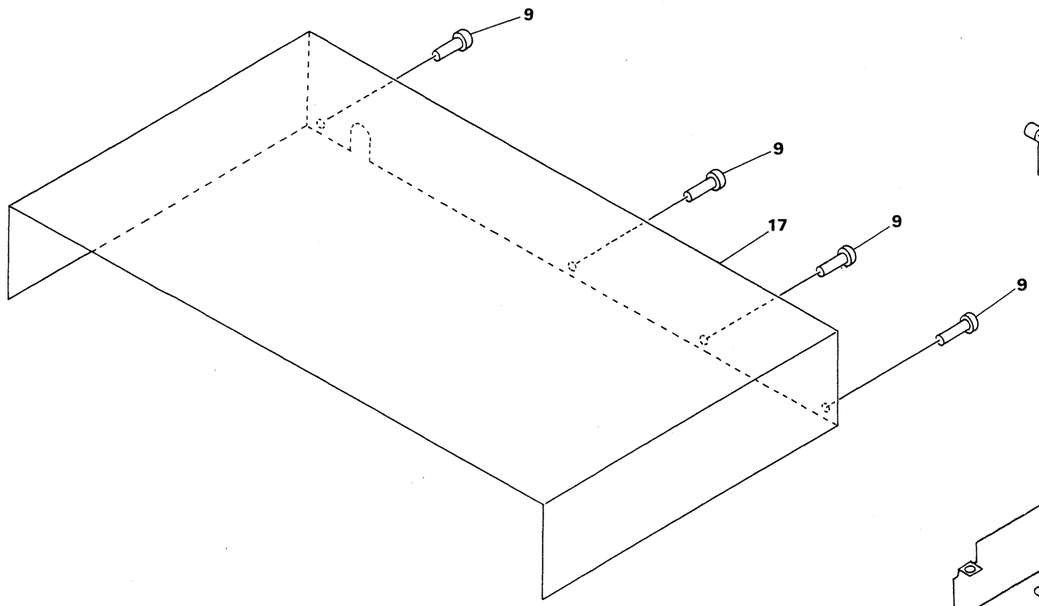


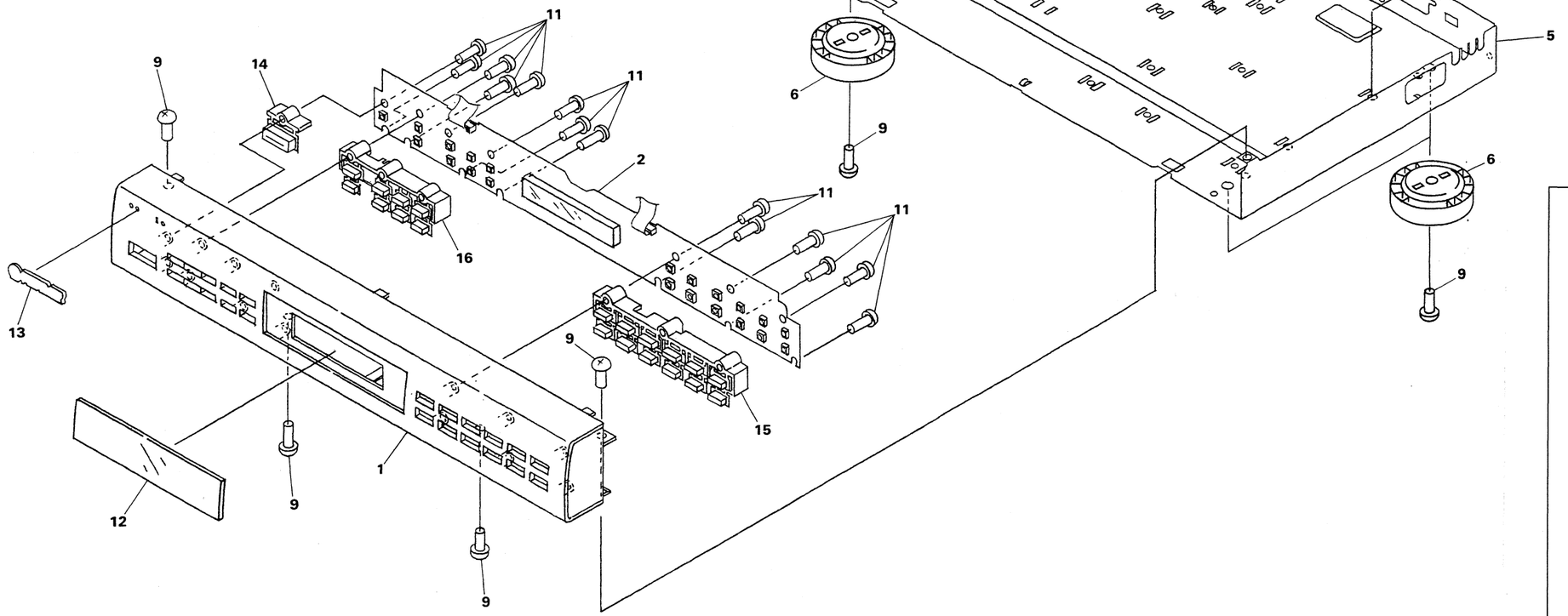
3. EXPLODED VIEWS, PACKING AND PARTS LIST

NOTES:

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by " ◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

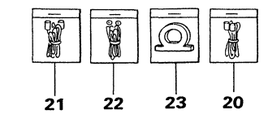
Mark	No.	Description	Parts No.
	1	FRONT PANEL	AMB2149
	2	CONTROL ASSEMBLY	AWP1049
⚠	3	FU1 (T400mA,250V)	AEK1044
⚠	4	AC POWER CORD	ADG1138
NSP	5	CHASSIS	ANA1122
	6	INSULATOR ASSEMBLY	AMR2140
⚠	7	STRAIN RELIEF	AEC−882
NSP	8	PCB MOULD	AMR1525
	9	SCREW	ABA−298
	10	SCREW	ABA1018
	11	SCREW	BBZ26P100FMC
	12	PANEL	AAK2466
	13	NAME PLATE (METAL)	AAM1058
	14	POWER BUTTON (ABS)	AAD2425
	15	STATION BUTTON (ABS)	AAD2426
	16	BAND BUTTON (ABS)	AAD2428
	17	BONNET(FE)	ANE1430
	18	OPE. INSTRUCTIONS (English/German/French/Italian/ Swedish/Dutch/Spanish/Portuguese)	ARE1278
	19	.....	
	20	CONNECTION CORD WITH PIN PLUG	ADE−052
	21	CONNECTION CORD WITH MINI PLUG	ADE−085
	22	FM ANTENNA	ADH1005
	23	LOOP ANTENNA	ATB1006
	24	STYROL PROTECTOR L	AHA1602
	25	STYROL PROTECTOR R	AHA1603
	26	PACKING CASE	AHD2550
	27	PACKING SHEET	AHG1107
	28	TUNER ASSEMBLY	AWZ4971
	29	POWER ASSEMBLY	AWZ4976
	30	3 SERIAL F.E.MODULE ASSEMBLY	AXQ1003

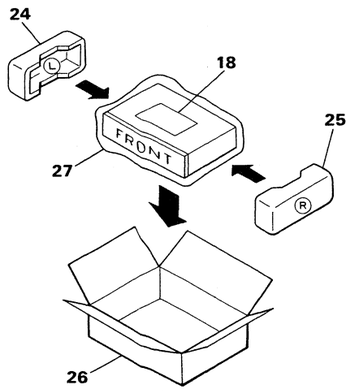




NOTE : Screws adjacent to ▼ mark on product are used for disassembly.

• PACKING





4. PCB PARTS LIST

NOTES:

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by " ◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω → 56×10¹ → 561 ..... RD1/8PM 5 6 1 J
47kΩ → 47×10³ → 473 ..... RD1/4PS 4 7 3 J
0.5Ω → 0R5 ..... RN2H 0 R 5 K
1Ω → 010 ..... RS1P 0 1 0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ → 562×10¹ → 5621 ..... RN1/4PC 5 6 2 1 F

Mark	No.	Description	Parts No.
LIST OF ASSEMBLIES			
NSP	TUNER ASSEMBLY		AWE1278
	├ TUNER ASSEMBLY		AWZ4971
	└ POWER ASSEMBLY		AWZ4976
	CONTROL ASSEMBLY		AWP1049
TUNER ASSEMBLY			
SEMICONDUCTORS			
	IC103		AN7470P
	IC102		LA1265S
	IC101		LM7001
	Q116		2SA933S
	Q103,Q112,Q114,Q115		2SC1740S
	Q111		2SC1740SLN
	Q101,Q102		2SC2668
	Q110		2SK246
	Q104,Q106,Q108		DTA124ES
	Q105,Q107,Q109,Q118		DTC143ES
	D102－D108		1SS252
COILS, FILTERS			
	L102		ATE－079
	L103		LAU2R2K
	F103		ATF－107
	F101,F102		ATF－119
	F104		ATF－208
CAPACITORS			
	C141	(470P,50V)	ACE1039
	C109,C117,C118		CCDCH150J50
	C115,C119－C121		CCPUSL470J50
	C138		CEANP4R7M50
	C133		CEAS010M50
	C127		CEAS100M50
	C128,C137		CEAS101M16
	C143		CEAS1R5M50
	C126,C151,C152		CEAS2R2M50
	C111		CEAS330M16
	C142		CEAS3R3M50
	C135,C150		CEAS470M10
	C123		CEAS4R7M50
	C144		CEASR22M50
	C112		CFTXA224J50
	C107		CKDYB103K50
	C124		CKDYB222K50
	C153,C154		CKDYB682K50
	C132		CKDYF103Z50
	C4,C122,C130,C131		CKDYF223Z50
	C2		CKDYX103M25
	C125,C146		CKDYX473M25
	C3		CKPUYB101K50
	C101,C102		CKPUYB102K50
	C147		CKPUYB121K50
	C134		CKPUYB331K50
	C108,C110		CKPUYF473Z16
	C103,C104,C106,C113,C114, C116,C129,C136,C145		CKPUYY103M16
	C148,C149		CQMA102J50
RESISTORS			
	VR101	(4.7K)	ACP1042
	VR102	(10K)	ACP1043
	VR103	(22K)	ACP1044
		Other Resistors	RD1/8PM□□□J
OTHERS			
		AM RF TUNING BLOCK	AXX1026
	X101	CRYSTAL RESONATOR (7.200MHz)	ASS1042
	X102	CERAMIC RESONATOR	ATF1027
		ANTENNA TERMINAL 4－P	AKA1010
	CN2	CONNECTOR(9P)	KPE9
		3 serial F.E. Module ASSY	AXQ1003

Note: 3 serial F.E. Module ASSY has no service part.

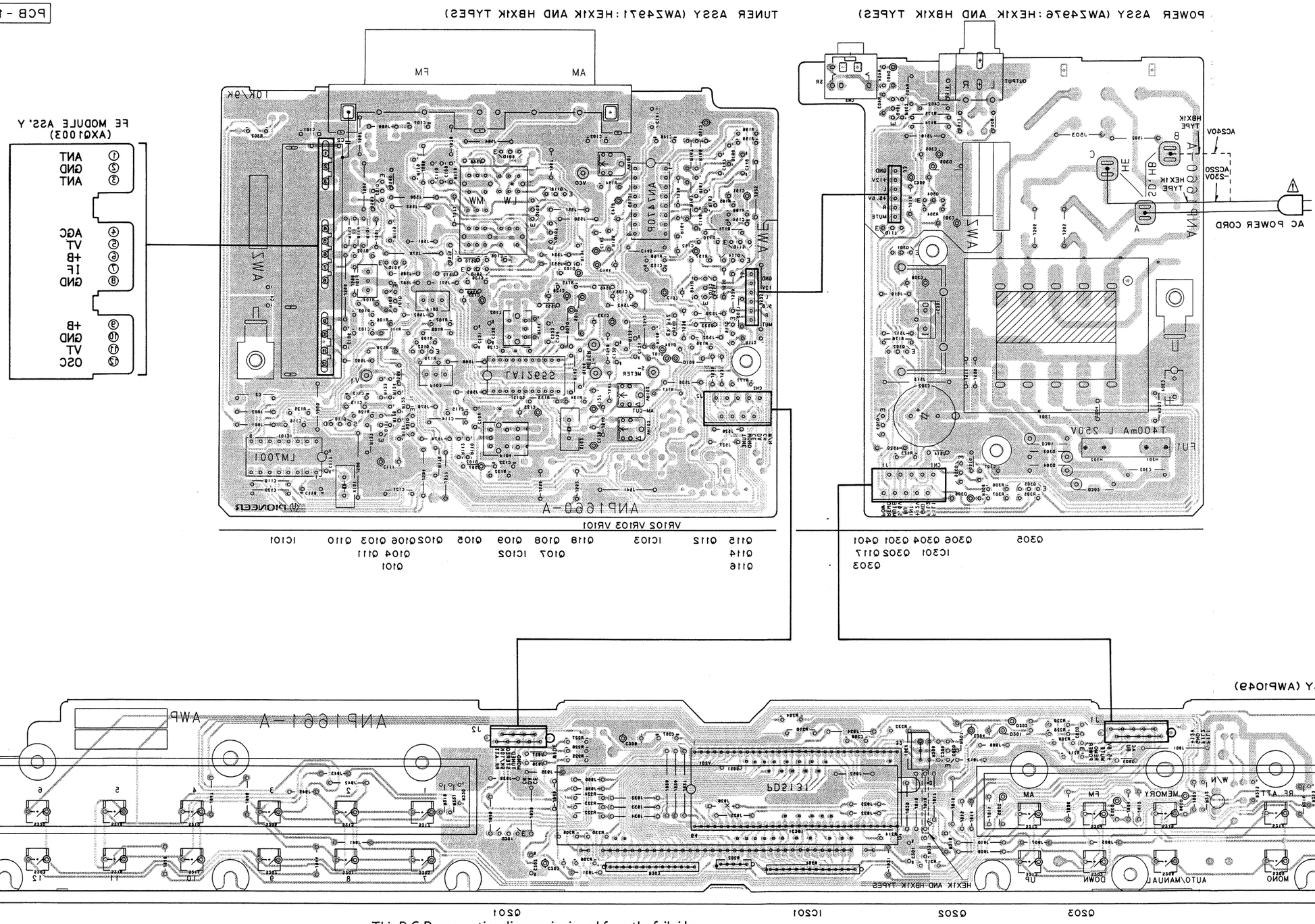
Mark	No.	Description	Parts No.
POWER ASSEMBLY			
SEMICONDUCTORS			
	IC301		MC7812CT
	Q301		2SA1529
	Q117,Q305,Q401		2SC1740S
	Q304		2SC1845
	Q302		DTA143ES
	Q303,Q306		DTC143ES
	D306,D401		1SS252
	D305		RD6.2ESB
	D301－D304		S5566
TRANSFORMER			
⚠	T301		ATT1226
CAPACITORS			
⚠	C303	(0.047, 25V)	ACG－009
	C304		ACH1135
	C301		CEAS101M16
	C302		CEAS222M35
	C308		CEAS330M16
	C305,C306		CEAS470M10
	C307,C402		CKPUYB101K50
RESISTORS			
		All Resistors	RD1/8PM□□□J
OTHERS			
		PIN JACK(2P)	AKB1039
	CN3	JACK	AKN1006
	CN1	CONNECTOR(10P)	KPE10
		SCREW	ABA1012

Mark	No.	Description	Parts No.
CONTROL ASSEMBLY			
SEMICONDUCTORS			
	IC201		PD5131－A
	Q203		2SC1740S
	Q202		DTC124ES
	Q201		DTC143ES
	D201－D207		1SS252
SWITCHES			
	S201－S221		ASG1034
CAPACITORS			
	C208		CEJA221M6
	C203		CEJA470M16
	C204		CEJAR47M50
	C207		CKDYX473M25
	C206		CKPUYB101K50
	C205		CKPUYB102K50
	C201,C202		CKPUYY103M16
RESISTORS			
	R201,R203		RA13T103J
	R202		RA4T103J
		Other Resistors	RD1/8PM□□□J
OTHERS			
	X201	CERAMIC RESONATOR (4.19MHz)	ASS1018
	V201	FL TUBE	AAV1093

5. SCHEMATIC AND PCB CONNECTION DIAGRAMS

5.1 PCB CONNECTION DIAGRAMS OF CONTROL, TUNER AND POWER ASSEMBLIES

PCB - 1



This P.C.B. connection diagram is viewed from the parts mounted side.

PCB - 1

POWER ASSY (AWZ4976 : HEX1K AND HBX1K TYPES)

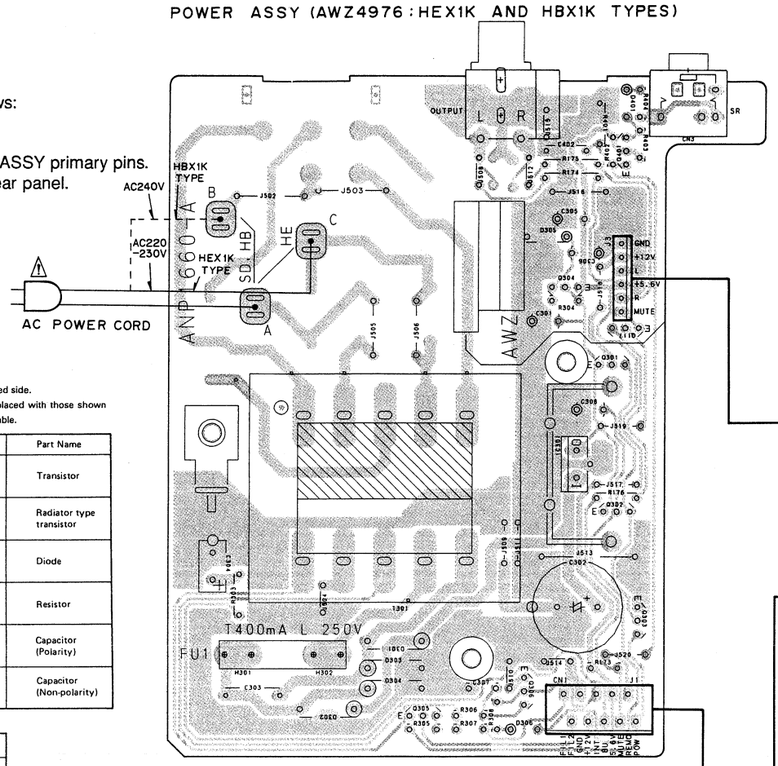
TUNER ASSY (AWZ4971 : HEX1K AND HBX1K TYPES)

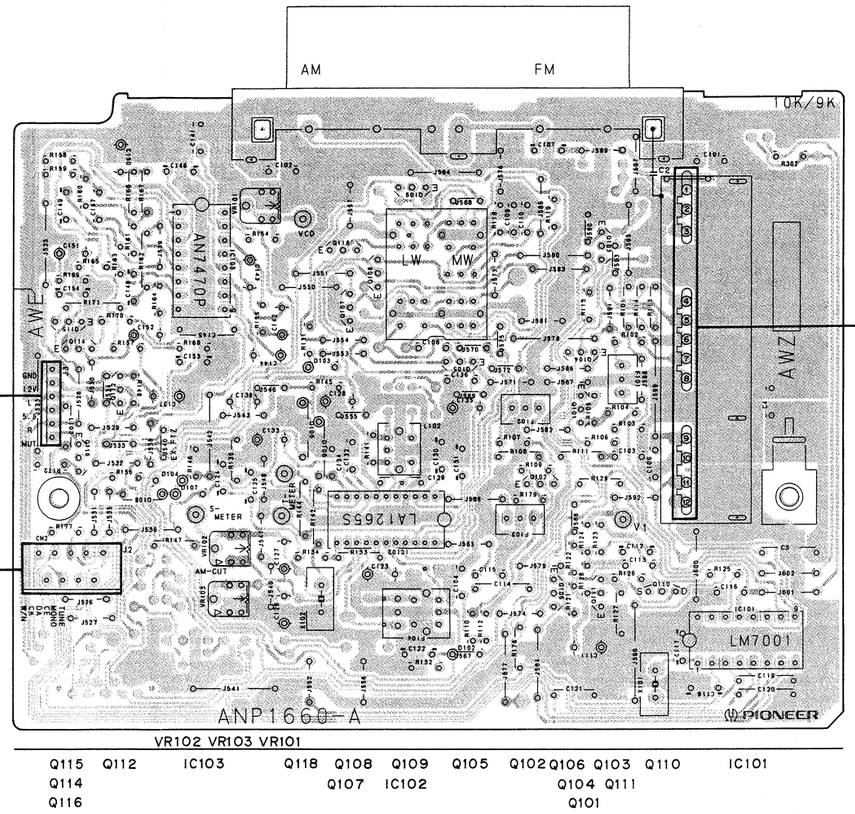
Line Voltage Selection

Line Voltage can be changed as follows:

1. Disconnect the AC power cord.
2. Remove the cover.
3. Change the connection of POWER ASSY primary pins.
4. Stick the line voltage label on the rear panel.

Part No.	Description
AAX-193	220V label
AAX-192	240V label





FE MODULE ASS'Y (AXQ1003)

①	ANT
②	GND
③	ANT
④	AGC
⑤	VT
⑥	+B
⑦	IF
⑧	GND
⑨	+B
⑩	GND
⑪	VT
⑫	OSC

NOTE

1. This P.C.B connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wirng symbols listed in the following Table.

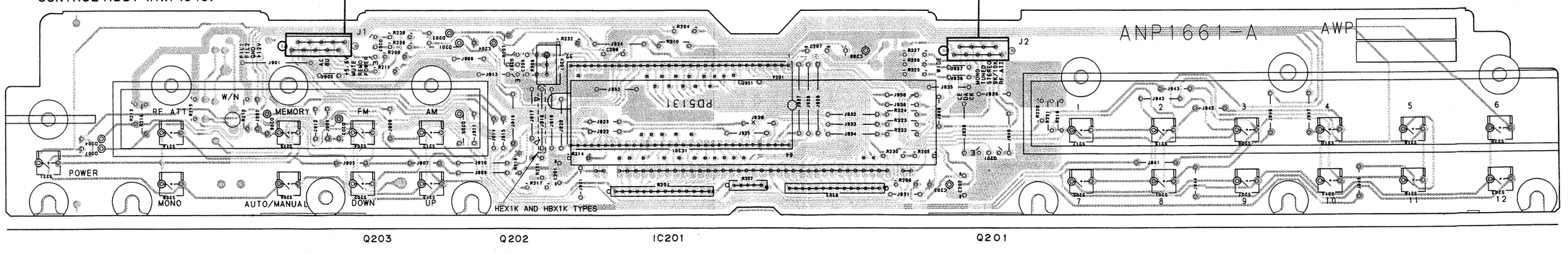
P.C.B. pattern diagram indication	Corresponding part symbol	Part Name
Q504	Q504 or Q504	Transistor
Q215	Q215 or Q215	Radiator type transistor
D203	D203	Diode
R237	R237	Resistor
C513	C513	Capacitor (Polarity)
C518	C518	Capacitor (Non-polarity)

Others

P.C.B. pattern diagram indication	Part Name
IC	IC
S	Switch
RY	Relay
L	Coil
F	Filter
VR	Variable resistor or Semi-fixed resistor

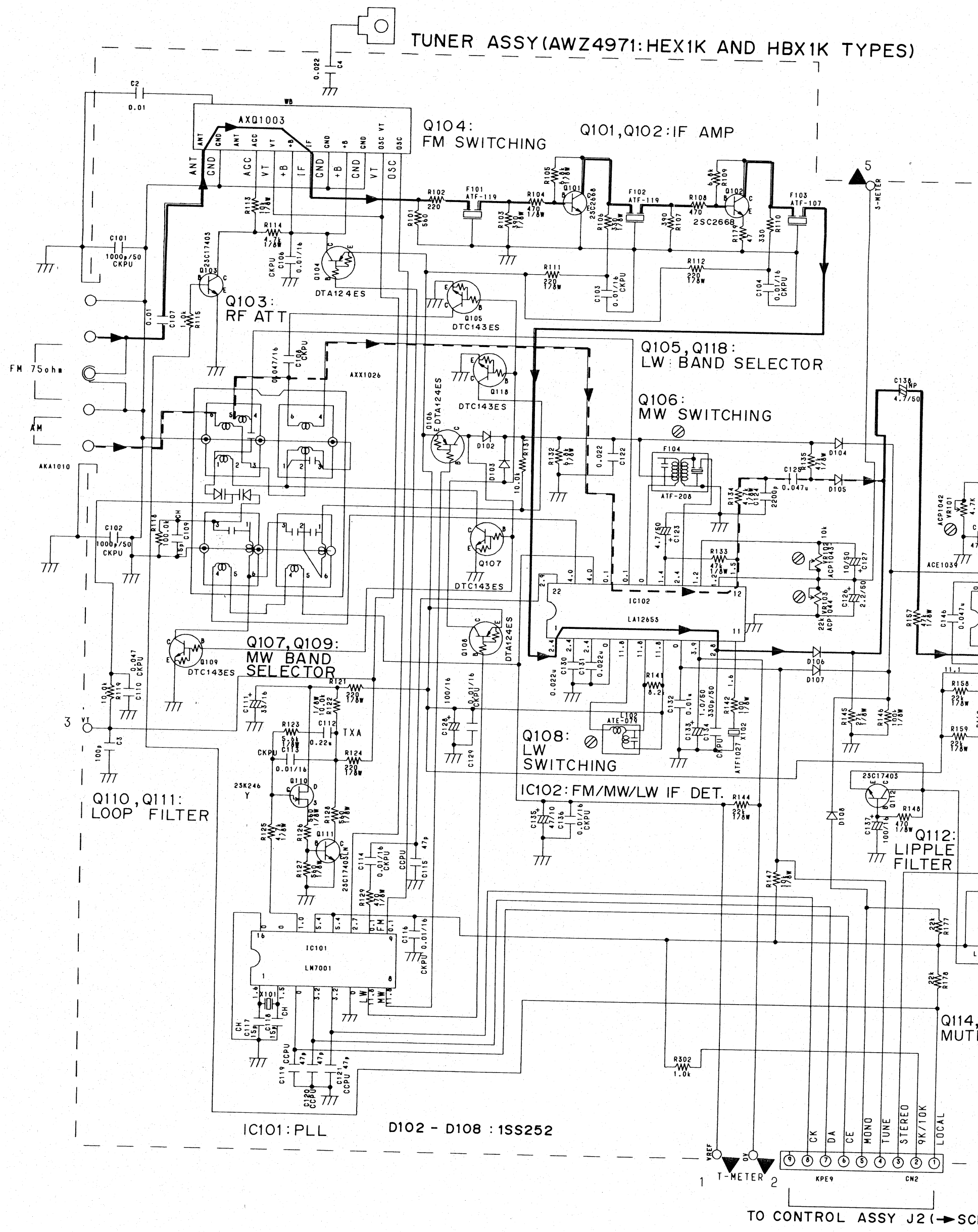
3. The capactor terminal marked with ◎ (double circles) shows negative terminal.
4. The diode terminal marked with ◎ (double circles) shows cathode side.
5. The transistor terminal to which E is affixed shows the emitter.

CONTROL ASSY (AWP1049)



5.2 SCHEMATIC DIAGRAM OF TUNER AND POWER ASSEMBLIES (FOR F-202L/HEX1K AND HBX1K)

Note: For F-202/HEWZX1K and HEWIX1K, refer to SCH-3.



SCH-1 TUNER, POWER ASSY

Note: (Type 3)

1. **When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".**
2. **Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.**
3. **RESISTORS:**
   Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
   Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
   Tolerance: (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% or ±5% unless otherwise noted.
4. **CAPACITORS:**
   Unit: p:pF or μF unless otherwise noted.
   Ratings: capacitor (μF)/ voltage (V) unless otherwise noted.
   Rated voltage: 50V except for electrolytic capacitors.
5. **COILS:**
   Unit: m:mH or μH unless otherwise noted.
6. **VOLTAGE AND CURRENT:**
   mV : Signal voltage at FM 1kHz, 100% MOD.
   : DC voltage (V) at no input signal unless otherwise noted.
   Value in ( ) is DC voltage at rated power.
   ⇦ mA or ← mA : DC current at no input signal unless otherwise noted.
7. **OTHERS:**
   - ➡ : Signal route.
   - ⊘ : Adjusting point.
   - ▼ (Red) : Measurement point.
   - The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.
8. **SWITCHES** (Underline indicates sv
   CONTROL ASSEMBLY
   S201 : 8
   S202 : TUNING(DOWN)
   S203 : 12
   S204 : BAND(FM)
   S205 : 7
   S206 : 3
   S207 : 9
   S208 : AUTO/MAMUAL
   S209 : MONO
   S210 : 4
   S211 : 10
   S212 : BAND(AM)
   S213 : TUNING(UP)
   S214 : RF ATT
   S215 : 2
   S216 : 11
   S217 : 1
   S218 : 5
   S219 : MEMORY
   S220 : 6
   S221 : POWER(STANDBY/ON)
9. For SCH – □ on the schematic diagr
   SCH – □ indicates the drawing
diagram.
   (SCH stands for schematic diagram.)

HEX1K AND HBX1K TYPES)

02:IF AMP

Q105, Q118:
LW: BAND SELECTOR

Q106:
MW SWITCHING

LW IF DET.

Q112:
LIPPLE
FILTER

IC103 : MPX

Q114, Q115:
MUTING

Q116 : MUTE SWITCH

:FM SIGNAL LINE
:AM SIGNAL LINE

POWER ASSY (AWZ4976 : HEX1K AND HBX1K TYPES)

Q302:
SWITCHING

IC301, Q301, Q304:
REGULATOR

Q401:
BUFFER

Q303, Q305:
POWER DETECTOR

Q117 : MUTE SWITCHING
D301 – D304 : S5566
D306, D401 : 1SS252

TO CONTROL ASSY J2 (➡SCH-2)

TO CONTROL ASSY

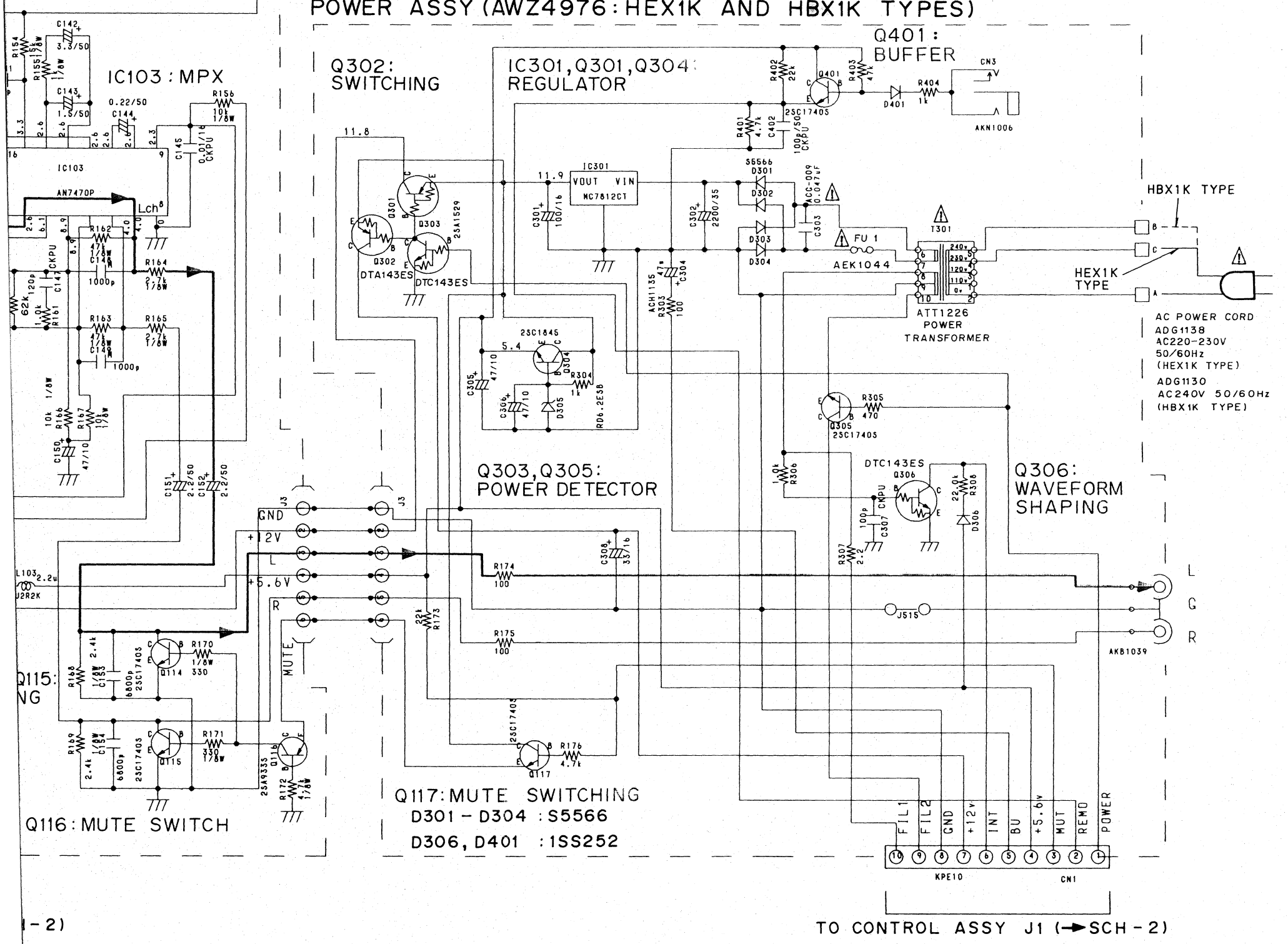
Note: (Type 3)

1. **When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".**
2. **Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.**
3. **RESISTORS:**
   Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
   Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
   Tolerance: (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% or ±5% unless otherwise noted.
4. **CAPACITORS:**
   Unit: p:pF or μF unless otherwise noted.
   Ratings: capacitor (μF)/ voltage (V) unless otherwise noted.
   Rated voltage: 50V except for electrolytic capacitors.
5. **COILS:**
   Unit: m:mH or μH unless otherwise noted.
6. **VOLTAGE AND CURRENT:**
   mV : Signal voltage at FM 1kHz, 100% MOD.
   : DC voltage (V) at no input signal unless otherwise noted. Value in ( ) is DC voltage at rated power.
   ⇦ mA or ← mA : DC current at no input signal unless otherwise noted.
7. **OTHERS:**
   - ➡ : Signal route.
   - ⊘ : Adjusting point.
   - ▼ (Red) : Measurement point.
   - The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.
8. **SWITCHES** (Underline indicates switch position):
   CONTROL ASSEMBLY
   S201 : 8
   S202 : TUNING(DOWN)
   S203 : 12
   S204 : BAND(FM)
   S205 : 7
   S206 : 3
   S207 : 9
   S208 : AUTO/MAMUAL
   S209 : MONO
   S210 : 4
   S211 : 10
   S212 : BAND(AM)
   S213 : TUNING(UP)
   S214 : RF ATT
   S215 : 2
   S216 : 11
   S217 : 1
   S218 : 5
   S219 : MEMORY
   S220 : 6
   S221 : POWER(STANDBY/ON)
9. For SCH – □ on the schematic diagram
   SCH – □ indicates the drawing number of the schematic diagram.
   (SCH stands for schematic diagram.)

SCH–1

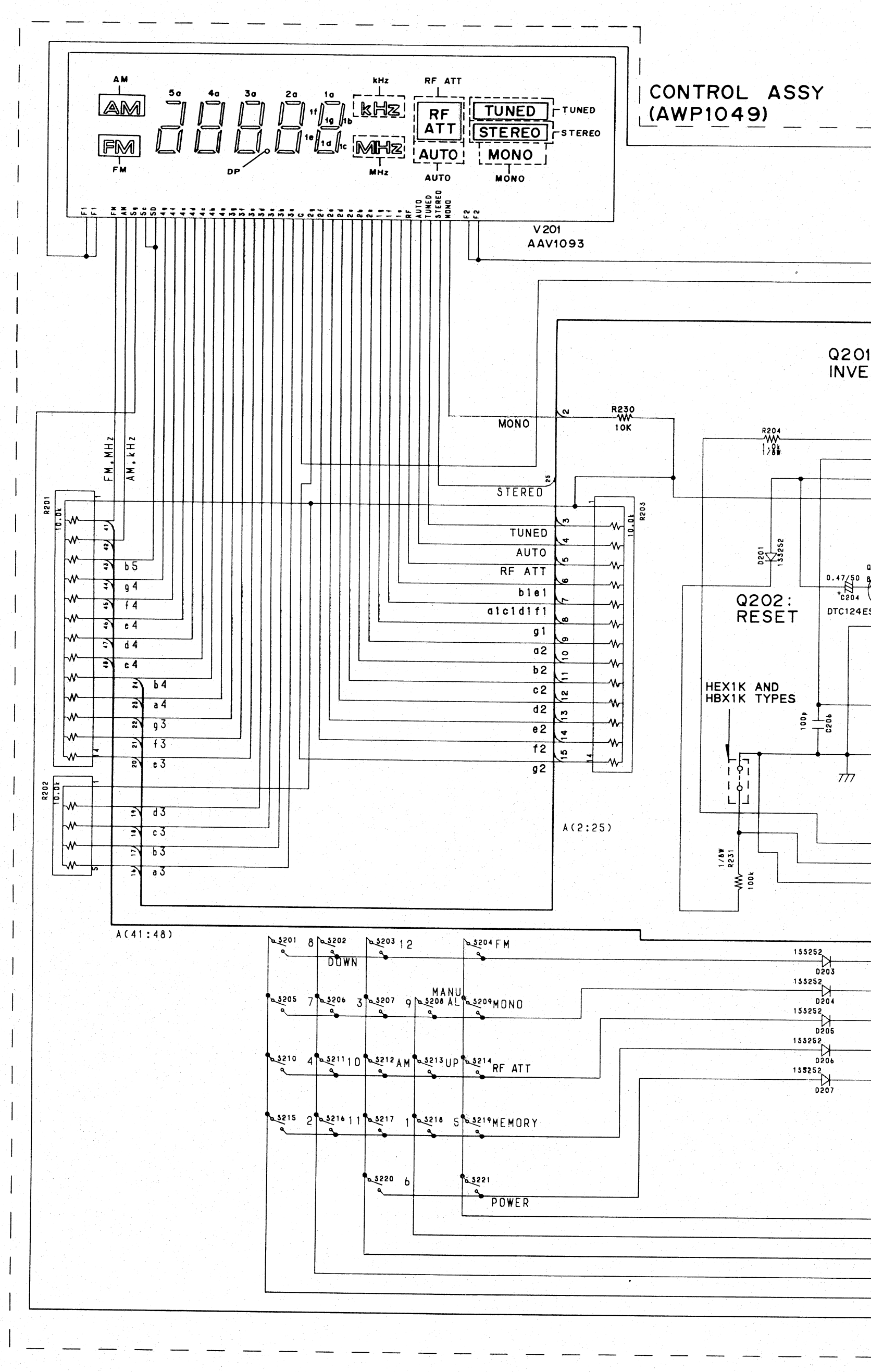
—————:FM SIGNAL LINE
– – – – – –:AM SIGNAL LINE

POWER ASSY (AWZ4976 : HEX1K AND HBX1K TYPES)



TUNER, POWER ASSY **SCH-1**

5.3 SCHEMATIC DIAGRAM OF CONTROL ASSEMBLY



SCH-2 CONTROL ASSY

CONTROL ASSY
(AWP1049)

TUNED
STEREO
MONO
MONO

V201
AAV1093

TO POWER ASSY CN1
(→SCH-1)or(→SCH-3)

J1

FIL1
C201 0.01
3.3V(AC)
C202 0.01
FIL2

GND
+12V
AC
Back up
+5.6V
MUTE
REMO IN
POWER

11.6V

TO TUNER ASSY CN2
(→SCH-1)or(→SCH-3)

J2

CE
DA
CK
MONO
TUNE
STEREO
9k/10k
RF ATT

R205 470 1/8W
C203 47/16
R206 5.6k
Q201
DTC143ES

Q201:
INVERTER

MONO
R230 10K
STEREO
TUNED
AUTO
RF ATT
b1e1
a1c1d1f1
g1
a2
b2
c2
d2
e2
f2
g2
R203 10.0k
A(2:25)

R204 1.0k 1/8W
D201 1SS252
R207 100.0k 1/8W
Q202
0.47/50 C204
DTC124ES
C205 1000p
R232 1.0k

Q202:
RESET

HEX1K AND
HBX1K TYPES

X201 AS3101B
C206 100p
R208 0M 1/8W
R231 1/8W 100k

R209 1.0k 1/8W
R228 22.0k
R229 1.0k
Q203 2SC1740S

Q203 : BUFFER

R210 1.0k 1/8W
R211 1.0k 1/8W

A(2:25)

D202 1SS252

RESET
GND
AC
POWER
TUNE IN
REMO IN
MUTE
c3
b3
a3
g2
f2
e2
d2
c2
b2
a2
g1
a1c1d1f1
b1e1
RF ATT
AUTO
TUNED
MONO

5.2V
+B
C207 0.047
C208 220/6

PD5131 IC201

R222 1.0k
R223 1.0k
R224 1.0k

K4
K3
K2
K1
K0
FM
AM
b5
g4
f4
e4
d4
c4
b4
a4
g3
f3
e3
d3
CK
DA
CE
ST4
ST3
ST2
ST1
STO

R225 2.2k 1/8W
R226 2.2k 1/8W

A(41:48)

IC201: MICRO COMPUTER

S204 FM
S209 MONO
S214 RF ATT
S219 MEMORY
S221 POWER

D203 1SS252
D204 1SS252
D205 1SS252
D206 1SS252
D207 1SS252

R212 4.7k
R213 4.7k
R214 4.7k
R215 4.7k
R216 4.7k

R217 47.0k
R218 47.0k
R219 47.0k
R220 47.0k
R221 47.0k

TO POWER ASSY CN 1
(→ SCH-1)or(→ SCH-3)

TO TUNER ASSY CN2
(→ SCH-1)or(→ SCH-3)

J1: 10 9 8 7 6 5 4 3 2 1 — FIL1, GND, +12V, AC, Back up, +5.6V, MUTE, REMO IN, POWER

J2: 9 8 7 6 5 4 3 2 1 — CE, DA, CK, MONO, TUNE, STEREO, 9k/10k, RF ATT

3.3V(AC)

C201 0.01 — FIL1

C202 0.01 — FIL2

11.6V

R205 470 1/8W

C203+ 47/16

R206 5.6k

Q201 DTC143ES

R207 100k 1/8W

C205 1000p

R232 1.0k

R209 1.0k 1/8W

R228 1.0k

R229 22.0k

Q203 2SC1740S

Q203 : BUFFER

R210 1.0k 1/8W

R211 1.0k 1/8W

A(2:25)

X201 AS31018

R208 1.0M 1/8W

RESET

GND

AC

POWER
TUNE IN
REMO IN
MUTE
c3 b3 a3 g2 f2 e2 d2 c2 b2 a2 g1 a1 c1 d1 f1 b1 e1
RF ATT
AUTO
TUNED
MONO

D202 1S1252

5.2V +B

C207 0.047

C208+ 220/6

R222 1.0k
R223 1.0k
R224 1.0k

R225 2.2k 1/8W
R226 2.2k 1/8W
R227 2.2k 1/8W

PD5131 IC201

VSS XOUT XIN *RESET CNVss *INT1 P30 P31 P32/*INT2 P33/CNTR P34/SIN P35/SOUT P36/CLK P37/SRDY P20 P21 P22 P23 P24 P25 P26 P27 P60 P61 P62 P63 P64 P65 P66 P67 VCC P40 P41 P42 P43 P44 P45 P46 P47 P00 P01 P02 P03 P04 P05 P06 P07 P10 P11 P12 P13 P14 P15 P16 P17 P50 P51 P52 P53 P54 P55 P56 P57

K4 K3 K2 K1 K0 FM AM b5 g4 f4 e4 d4 c4 b4 a4 g3 f3 e3 d3 CK DA CE ST4 ST3 ST2 ST1 STO

A(41:48)

IC201: MICRO COMPUTER

4.7k R212 4.7k R213 4.7k R214 4.7k R215 4.7k R216

47.0k R217 47.0k R218 47.0k R219 47.0k R220 47.0k R221

CONTROL ASSY **SCH-2**

6. ADJUSTMENTS

6.1 ADJUSTMENT OF THE FM TUNER SECTION

- Set the mode selector to FM BAND.
- Connect the wiring as shown in the Fig. 1.

Step No.	Adjustment Title	FM SG(1kHz, ±75kHz dev.)		Reception Frequency Display	Adjustment	
		Frequency(MHz)	Level(dBμV)		Adjustment Location	Specifications
1	Center adjustment*1	98.0	60	98.0MHz	L102	Adjust so that the voltage between the TP－1 and TP－2 becomes 0V±50mV.
2	VCO adjustment	Non-modulation	60	98.0MHz	VR101	Adjust so that the output of the TP－4 becomes 76kHz ±0.5kHz.
3	TUNED IND. Lighting level	98.0*2 (Stereo modulation)	15 (±3dB)	98.0MHz	VR103	Adjust so that the indicator lights up.

1:When FE module assembly has been replaced, make sure to adjust the center adjustment.

2:Stereo modulation : Main; 1kHz, L+R, ±68.25kHz dev.
Pilot; 19kHz, ±6.75kHz dev.

6.2 ADJUSTMENT OF MW TUNER SECTION

- Set the mode selector to MW BAND.
- Connect the wiring as shown in the Fig. 1.

Step No.	Adjustment Title	AM SG(400Hz, 30% Mod.)		Reception Frequency Display	Adjustment	
		Frequency(kHz)	Level(dBμV/m)		Adjustment Location	Specifications
1	Tracking adjustment *1	603	Weak input	603kHz	MW ANT. coil	Adjust so that the voltage between the TP—5 and GND becomes maximum.
2		1395		1395kHz	TC101	
3	IF adjustment *1	603		603kHz	F104	
4	TUNED IND. Lighting level	999	55(±5dB)	999kHz	VR102	Adjust so that the indicator lights up.

1:F—202/HEWIX1K only

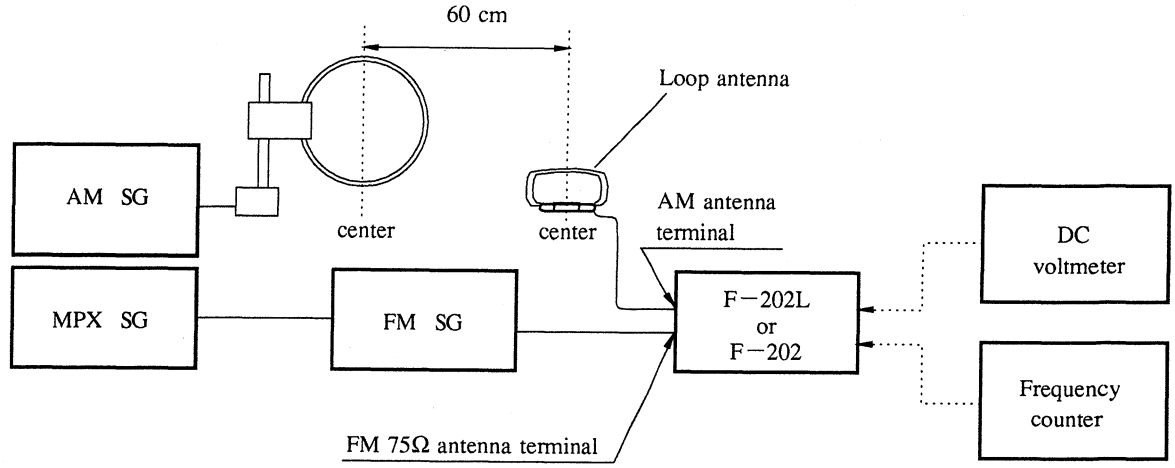


Fig. 1 Connection Diagram

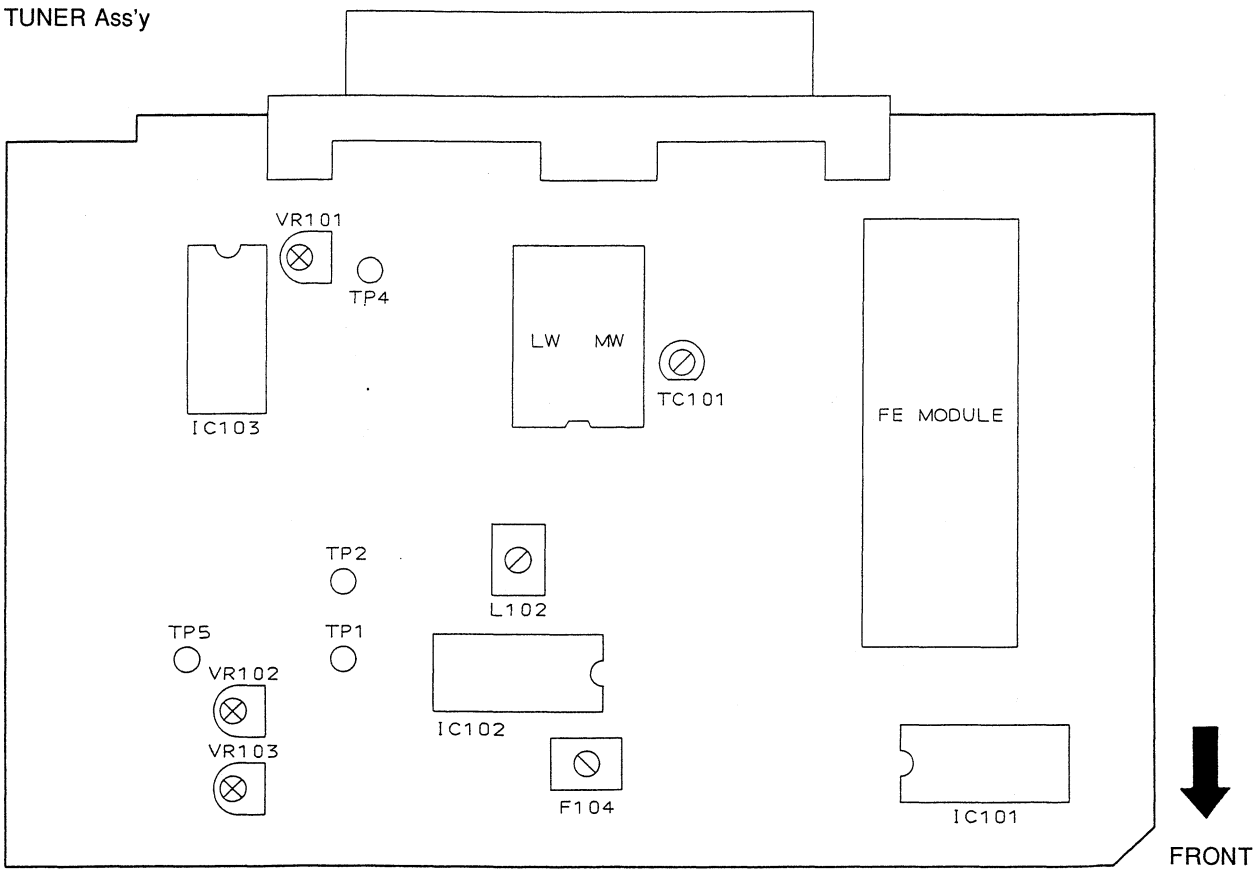


Fig. 2 Adjustment Points

7. FOR F－202L/HBX1K, F－202/HEWZX1K AND HEWIX1K

NOTES:
- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by " ◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

7.1 CONTRAST OF MISCELLANEOUS PARTS FOR F－202L/HBX1K, F－202/HEWZX1K AND HEWIX1K

F－202L/HBX1K, F－202/HEWZX1K, HEWIX1K and F－202L/HEX1K have the same construction except for the following:

Mark	Symbol & Description	Part No.				Remarks
		F—202L HEX1K	F—202L HBX1K	F—202 HEWZX1K	F—202 HEWIX1K	
NSP	TUNER assembly	AWE1278	AWE1278	AWE1276	AWE1277	
	TUNER assembly	AWZ4971	AWZ4971	AWZ4969	AWZ4970	
	POWER assembly	AWZ4976	AWZ4976	AWZ4974	AWZ4975	
	Earth screw	.....	.....	ABA1047	ABA1047	Refer to page 6.
⚠	AC power cord	ADG1138	ADG1130	ADG1138	ADG1138	
	FM antenna	ADH1005	ADH1005	.....	.....	
	FM antenna assembly	.....	.....	ADH1002	ADH1002	
	Packing case	AHD2550	AHD2550	AHD2549	AHD2549	
	Front panel	AMB2149	AMB2149	AMB2141	AMB2141	
	Operating instructions (English/German/French/Italian/ Swedish/Dutch/Spanish/Portuguese)	ARE1278	.....	.....	.....	
	Operating instructions (English)	.....	ARB1432	.....	.....	
	Operating instructions (German)	.....	.....	ARC1423	.....	
	Operating instructions (Italian)	.....	.....	.....	ARC1424	

TUNER ASSEMBLY
AWZ4969, AWZ4970 and AWZ4971 have the same construction except for the following:

Mark	Symbol & Description	Part No.			Remarks
		AWZ4971	AWZ4969	AWZ4970	
	C2	CKDYX103M25	.....	.....	
	C3	CKPUYB101K50	.....	.....	
	C105	.....	CKDYB103K50	CKDYB103K50	
	C108	CKPUYF473Z16	.....	.....	
	C139	.....	CKDYB122K50	CKDYB122K50	
	C140	.....	CEAS4R7M50	CEAS4R7M50	
	C153,C154	CKDYB682K50	.....	.....	

Mark	Symbol & Description	Part No.			Remarks
		AWZ4971	AWZ4969	AWZ4970	
	D101	.....	1SV156	1SV156	
	D102,D103	1SS252	.....	.....	
	F105	.....	ATF1088	ATF1088	
	L101	.....	LAU2R2K	LAU2R2K	
	Q105,Q107,Q109,Q118	DTC143ES	.....	.....	
	Q108	DTA124ES	.....	.....	
	Q113	.....	2SC1740S	2SC1740S	
	R116	.....	RD1/8PM270J	RD1/8PM270J	
	R117	.....	RD1/2PM561J	RD1/2PM561J	
	R131	RD1/8PM103J	.....	.....	
	R149	.....	RD1/8PM224J	RD1/8PM224J	
	R150	.....	RD1/8PM473J	RD1/8PM473J	
	R151	.....	RD1/8PM222J	RD1/8PM222J	
	R152	.....	RD1/8PM152J	RD1/8PM152J	
	R153	.....	RD1/8PM392J	RD1/8PM392J	
	R160	RD1/8PM623J	RD1/8PM683J	RD1/8PM683J	
	R168,R169	RD1/8PM242J	RD1/8PM912J	RD1/8PM242J	
	TC101	.....	.....	ACM-018	
	Antenna terminal (PAL 4P)	AKA1010	.....	.....	
	Antenna terminal (PAL 2P)	.....	AKA1012	AKA1012	
	3 serial FE module assembly	AXQ1003	.....	.....	
	4 serial FE module assembly	.....	AXQ1004	AXQ1004	
	AM RF tuning block	AXX1026	AXX1025	AXX1027	

Note: 4 serial FE module assembly has no service part.

POWER ASSEMBLY
AWZ4974, AWZ4975 and AWZ4976 have the same construction except for the following:

Mark	Symbol & Description	Part No.			Remarks
		AWZ4976	AWZ4974	AWZ4975	
	C1	.....	CKDYX103M25	CKDYX103M25	
	C155,C156	.....	CKDYB332K50	CKDYB392K50	
⚠	C309	.....	ACG1002	ACG1002	
	L104,L106	.....	LAU2R2K	LAU2R2K	
⚠	L301	.....	ATF-163	ATF-163	

7.2 PCB CONNECTION DIAGRAMS OF TUNER AND POWER ASSEMBLIES

TUNER ASSY (AWZ2470 : HEWZXIK TYPE)
(AWZ2469 : HEWIXIK TYPE)

PCB – 2

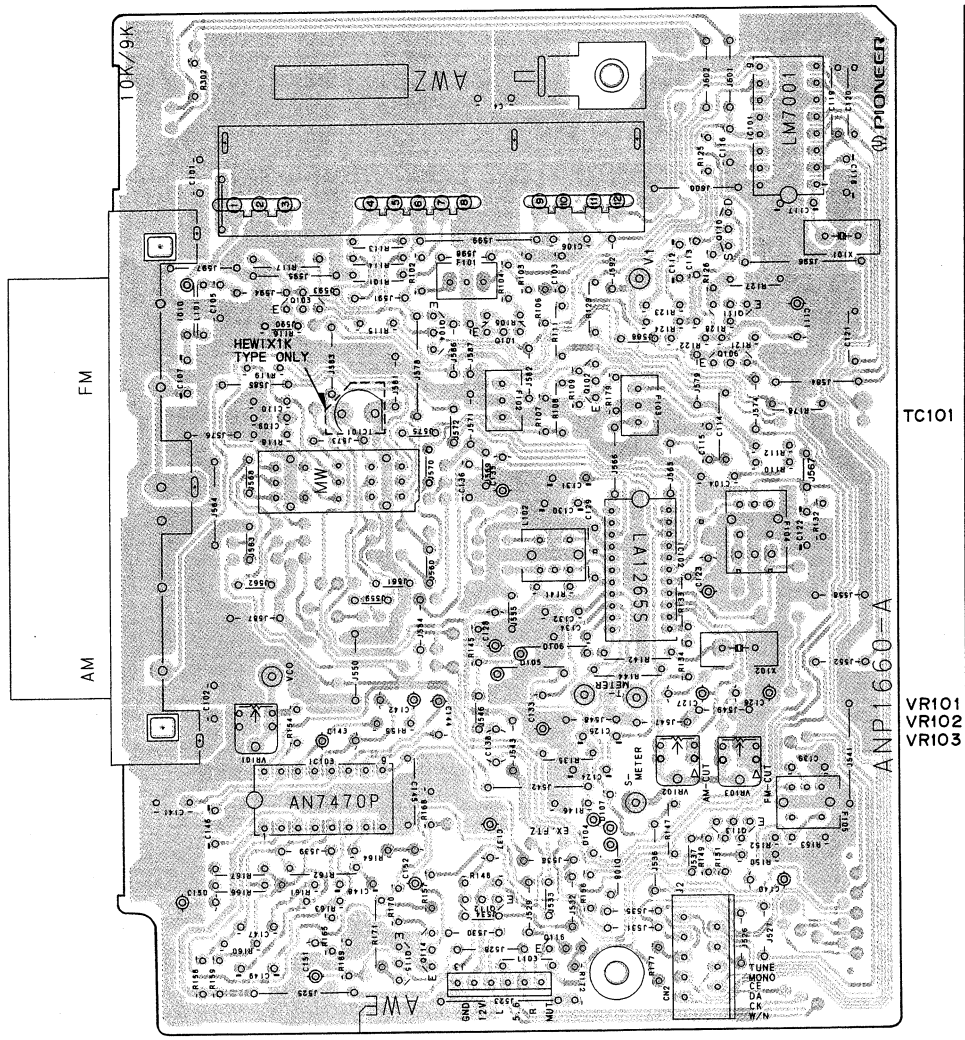
POWER ASSY (AWZ2475 : HEWZXIK TYPE)
(AWZ2474 : HEWIXIK TYPE)

This P.C.B. connection diagram is viewed from the foil side.

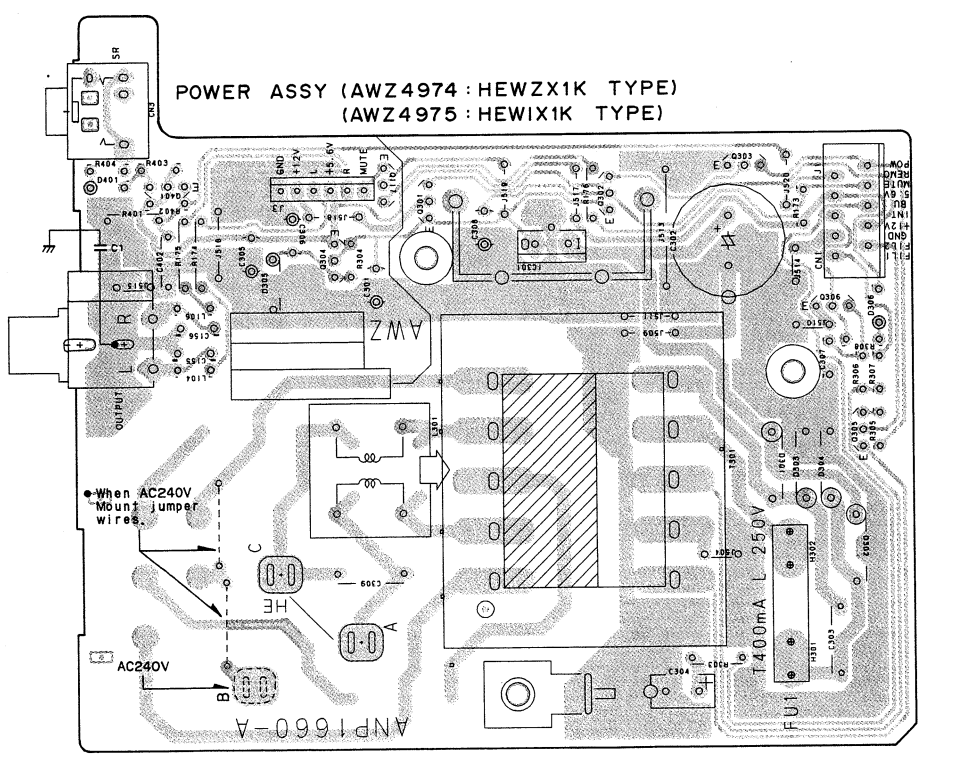
7.2 PCB CONNECTION DIAGRAMS OF TUNER AND POWER ASSEMBLIES

TUNER ASSY (AWZ4969 : HEWZX1K TYPE)
(AWZ4970 : HEWIX1K TYPE)

PCB - 2

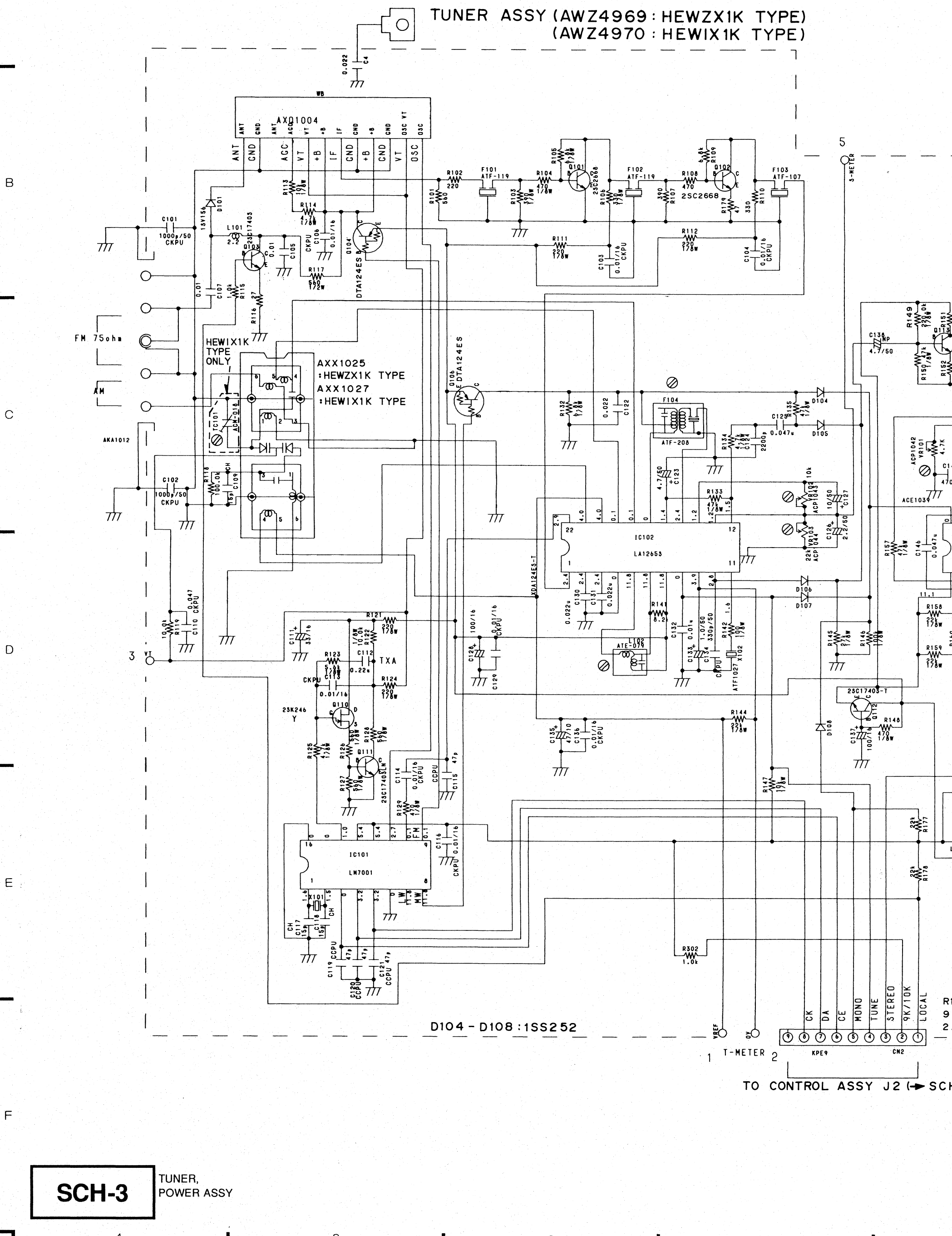


POWER ASSY (AWZ4974 : HEWZX1K TYPE)
(AWZ4975 : HEWIX1K TYPE)



This P.C.B. connection diagram is viewed from the parts mounted side.

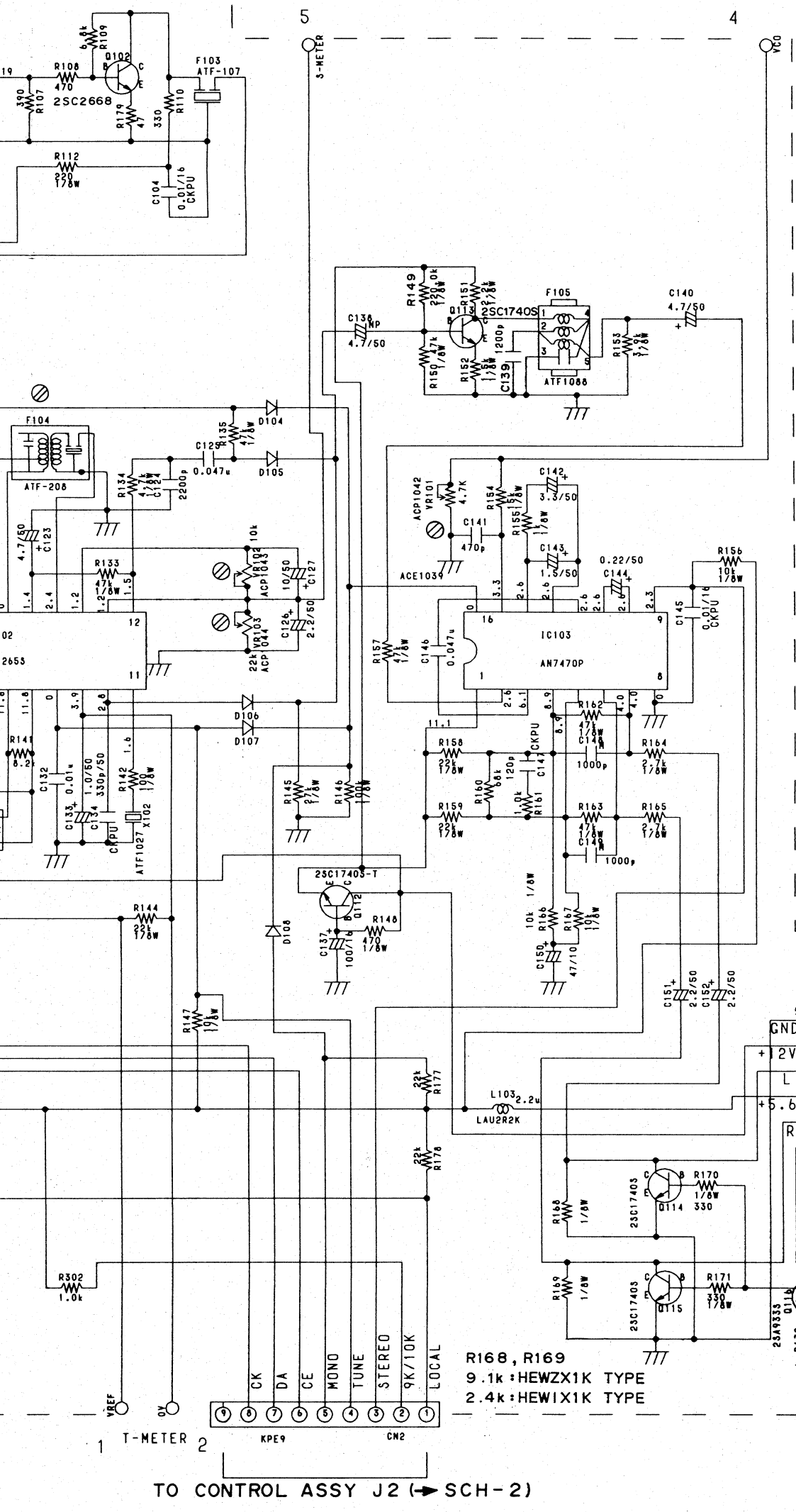
7.3 SCHEMATIC DIAGRAM OF TUNER AND POWER ASSEMBLIES (FOR F-202/HEWZX1K AND HEWIX1K)



SCH-3 TUNER, POWER ASSY

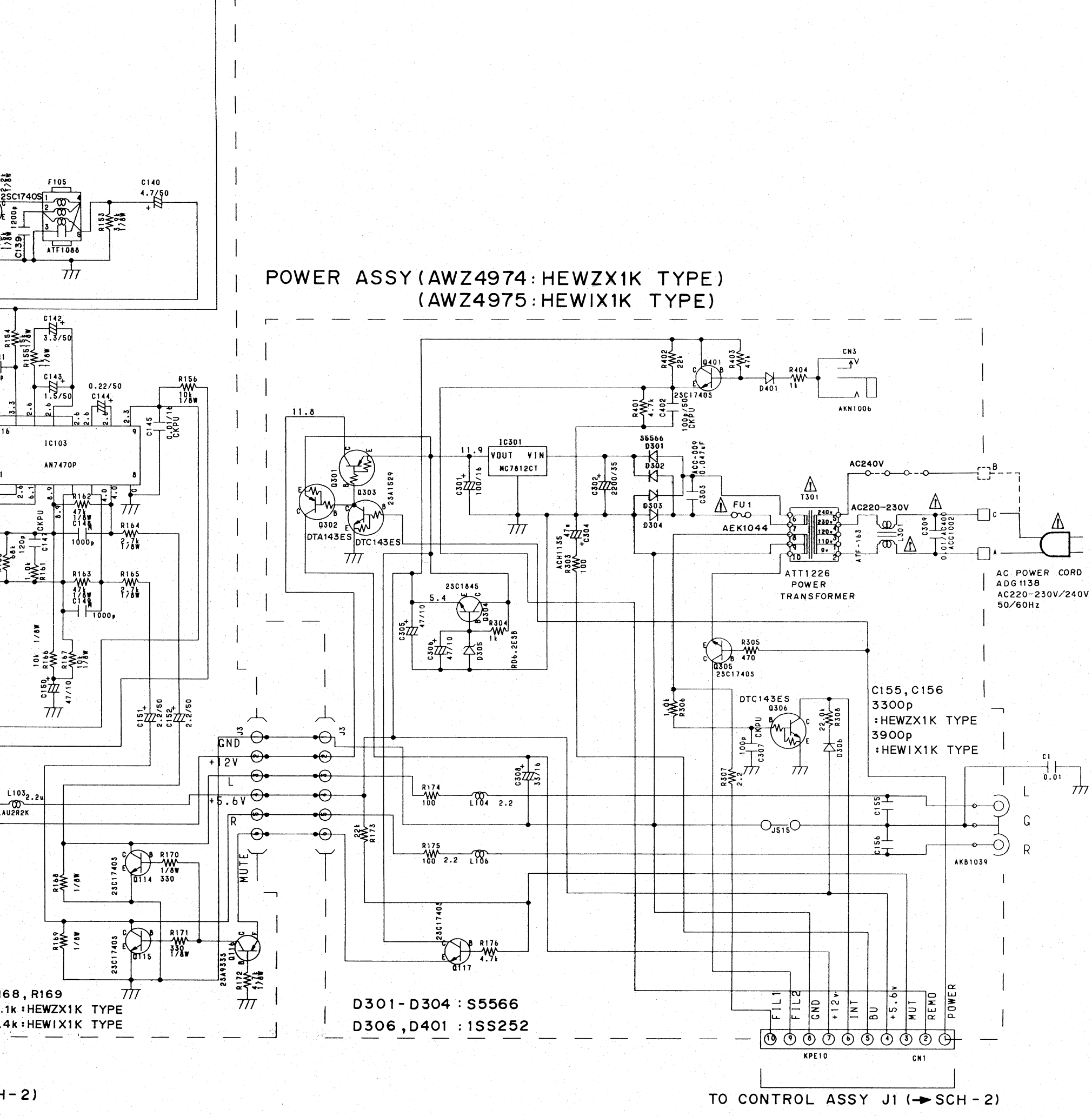
: HEWZX1K TYPE)
: HEWIX1K TYPE)

POWER ASSY (AWZ4974 : HEWZX1K TYPE)
(AWZ4975 : HEWIX1K TYPE)



SCH-3

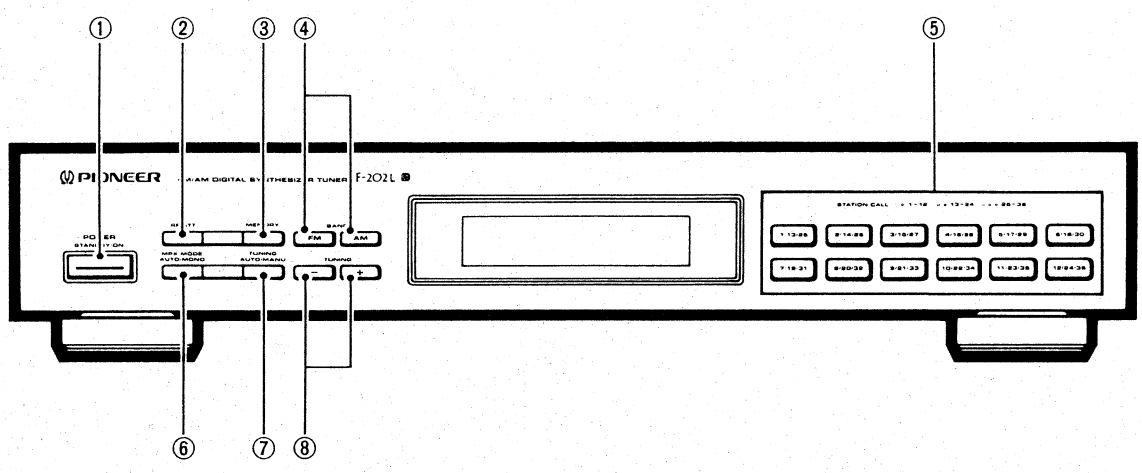
POWER ASSY (AWZ4974 : HEWZX1K TYPE)
(AWZ4975 : HEWIX1K TYPE)



TUNER, POWER ASSY **SCH-3**

8. PANEL FACILITIES

FRONT PANEL FACILITIES



① POWER (STANDBY/ON) switch

ON..... When set to the ON position, power is supplied and the unit becomes operational.

STANDBY... When set to STANDBY position, the main power flow is cut and the unit is no longer fully operational. A minute flow of power feeds the unit to maintain operation readiness.
Disconnect the power cord from the power outlet when you do not plan to use the unit for a long period of time.

NOTE:

- *The memory will be backed up so long as the power cord is not unplugged.*
- *If the power cord is unplugged, the memory will be retained for several days.*

② RF ATT button

Set this button to ON when receiving strong FM signals (nearby stations) to reduce sound distortion. [RF ATT] indicator lights.
Normally, this button should be set to OFF. This button does not affect AM reception.

NOTE:

This button's status is preset for each station in station memory.

③ MEMORY button

This button is used to memorize stations. When the button is pressed, the frequency indicator will flash. To memorize the frequency of any station, press STATION CALL button while the frequency display is flashing.

④ BAND (FM/AM) selector buttons

These are used to select the band of the desired station.

(F-202L U.K. model) AM reception

MW reception ⟶ LW reception ⟶

The bands change alternately each time the button is pressed.

⑤ STATION CALL buttons

These are used to preset stations and to recall a already preset station.

⑥ MPX (multiplex) MODE AUTO/MONO button

Mode changes as follows each time this button is pressed:

AUTO ⟶ MONO ⟶

This button does not affect AM reception.

AUTO:
Depending on the broadcast station, STEREO, or MONO is automatically selected.

NOTE:

When the signal level is too weak for reception, sound output is automatically muted.

MONO:
To receive stereo broadcasts in monaural.
"MONO" indicator lights up.

NOTE:

This button's status is preset for each station in station memory.

⑦ TUNING AUTO/MANU (Manual) button

Use to select either the auto tuning mode or manual tuning mode for FM/AM reception.
(When the auto tuning mode is selected, AUTO indicator will now light.)

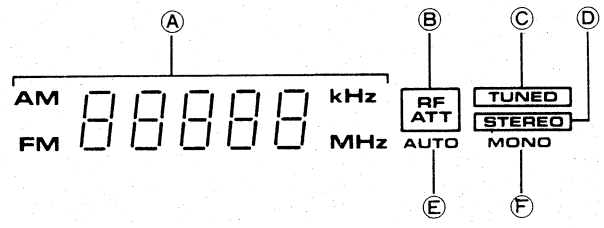
NOTE for F-202L:

Auto tuning is not possible on the LW band.

⑧ TUNING (− (down)/ + (up)) buttons

These are used to locate the stations.
Push the "−" button to go to a lower, and the "+" button to go to a higher frequency.

Display section



Ⓐ Frequency display
Shows received broadcast frequency. Also gives scrolling display of main function status. The FM band is indicated by MHz, and the AM band by kHz.

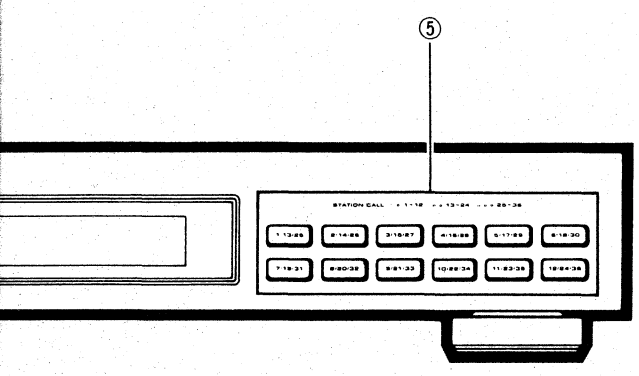
Ⓑ RF ATT indicator
Lights when the RF ATT button is set to on.

Ⓒ TU
Light

Ⓓ ST
Light
light

Ⓔ AU
Light

Ⓕ M
Light



⑤ STATION CALL buttons

These are used to preset stations and to recall a already preset station.

⑥ MPX (multiplex) MODE AUTO/MONO button

Mode changes as follows each time this button is pressed:

AUTO ⟶ MONO ⟶

This button does not affect AM reception.

AUTO:
Depending on the broadcast station, STEREO, or MONO is automatically selected.

NOTE:
When the signal level is too weak for reception, sound output is automatically muted.

MONO:
To receive stereo broadcasts in monaural.
"MONO" indicator lights up.

NOTE:
This button's status is preset for each station in station memory.

⑦ TUNING AUTO/MANU (Manual) button

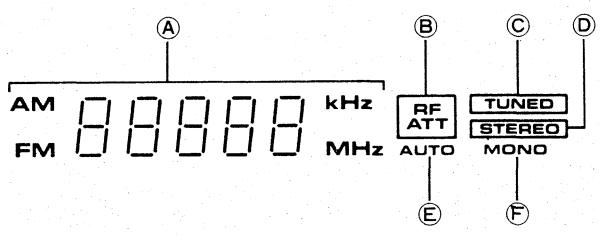
Use to select either the auto tuning mode or manual tuning mode for FM/AM reception.
(When the auto tuning mode is selected, AUTO indicator will now light.)

NOTE for F-202L:
Auto tuning is not possible on the LW band.

⑧ TUNING (− (down)/ + (up)) buttons

These are used to locate the stations.
Push the "−" button to go to a lower, and the "+" button to go to a higher frequency.

Display section



Ⓐ Frequency display
Shows received broadcast frequency. Also gives scrolling display of main function status. The FM band is indicated by MHz, and the AM band by kHz.

Ⓑ RF ATT indicator
Lights when the RF ATT button is set to on.

Ⓒ TUNED indicator
Lights when a broadcast is received and tuned in well.

Ⓓ STEREO indicator
Lights when a stereo broadcast is received. (The indicator does not light when the MPX MODE AUTO/MONO button is set to MONO.)

Ⓔ AUTO indicator
Lights when the TUNING AUTO/MANU button is set to AUTO.

Ⓕ MONO indicator
Lights when the MPX MODE AUTO/MONO button is set to MONO.